Trimalleolar Fractures

A Convenient Medial Approach for Surgical Reduction

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TRIMALLEOLAR FRACTURES are among the most serious of injuries to the ankle. By definition, the injury involves both medial and lateral malleoli and either the anterior or the posterior buttress of the tibia. As preface to a discussion of the indications for surgical treatment and a description of a method of approach that is simpler and easier than others that are in common use, a review of the anatomical structure may be helpful.

The ankle is a joint of saddle type, with the talus well protected by bony buttresses on both sides. Ligamentous support of the ankle joint is unusually good. The medial and lateral ligaments about the ankle joint—for example, the deltoid on the medial side—may be thought of as consisting of three major sections. They are the central section, which extends from the medial malleolus to the os calcis (the tibiocalcaneal), and the anterior and posterior section which are both attached to the talus ligaments. Similarly divided are the ligaments about the lateral side of the joint. Broadly, there is a large central section which may be called the fibulocalcaneal ligament, and anterior and posterior to this section are the talofibular ligaments. The tibiofibular ligaments hold the tibia and fibula together close to the ankle joint and constitute support so strong that stress strong enough to fracture either the medial or lateral malleolus or both nearly always damages the ligaments also. Often if there is great vertical stress, either the posterior portion of the tibial saddle or the anterior portion of the tibial saddle is fractured off. With the stabilizing structures thus removed, dislocations occur.

Of principal concern in considering operation are the degree of instability and the degree of comminution: Is operation warranted, and, if it is, can the anatomical structure be improved. Since both malleoli are fractured in so many cases, let us consider this as the usual occurrence, the decision as to whether to operate then resting on the degree of stability of the ankle joint. If the joint is dislocated and it is observed on reducing the fracture that the ankle mortis is not stable and that the fracture easily redislocates, then it is usually necessary to

● In dealing surgically with trimalleolar fracture of the ankle joint in which the comminution is not severe, the medial approach is convenient and practicable. In the process of reducing the fracture the alignment can be directly observed. The fixation of the posterior fragment is done from the front rather than from the back of the tibia. Removal of the screws used for fixation is made considerably easier.

provide internal stability. In general, when approximately one-quarter or more of either the anterior or posterior weight-bearing surface of the joint is involved, the instability is severe enough to necessitate such a procedure. In those circumstances, open reduction is the treatment of choice. Sometimes, usually in elderly patients, there is so much comminution of the lower end of the tibia that joining the pieces together well enough to provide a good ankle joint would be impossible. In such cases the same rules that apply to treatment of comminuted wrist fractures in the elderly should apply.

Although most of the reports in the current literature recommend a posterior or posterolateral approach for dealing with a posterior fractured fragment of the tibia, a medial approach such as is used for medial malleolar fractures is easier and serves quite as well. Indeed I consider the medial "J"-type of incision just behind the medial malleolus and extending upward about three or four inches and forward below the malleolus far enough so that the flap can be pulled forward in front of the medial malleolus, to be the approach of choice. Abrasion of the skin at that site is a contraindication, but not an absolute one if operation is being done soon after injury.

Once the fracture site has been opened and the medial malleolar fracture is displaced merely by pulling on the foot, the talus can be pulled away from the tibial articulation, permitting inspection of the degree of damage to the joint cartilage. It is also possible to see how much of the joint surface is involved in the fracture site. Reduction of the posterior or anterior fragments can then be accomplished, while traction is being applied, by pushing the posterior fragment down until the joint surfaces are aligned. Occasionally small pieces of bone that have become wedged in

the fissure have to be removed before the main fragment can be seated firmly. Although it may not hold quite as well, a screw placed from the anterior to the posterior is adequate and so much easier than putting it through from the back to the front that I consider it the method of choice for holding this particular fracture. After a hole of suitable gauge has been drilled through the fragment and the intact bone, a screw long enough to span the full diameter of the lower end of the tibia is placed. Occasionally it is necessary to place two screws to hold the pieces together. With this done, the reduction of the dislocation should be relatively easy to maintain and, when relaxed, the ankle joint should be quite stable. It is then possible to deal with the medial malleolus. As a general rule, nothing need be done to the lateral malleolus, since after the medial malleolus is reduced, the talus can be held firmly against it as a buttress. After the medial malleolus has been reduced, a screw may be used to hold the fragment in place, but as a general rule I prefer merely to place a large Kirschner wire or small Steinmann pin through the medial malleolus to hold it solidly in alignment with the tibia. Once this has been done, the ankle can be treated in a manner similar to that usually used for a Pott's fracture. The wound is closed in the normal anatomical fashion, dry dressings are applied, and a long leg cast, with the knee flexed to 45 degrees and the foot at approximately 90 degrees, is used for immobilization. It is usually desirable to place the foot in some inversion in order to maintain contact between the talus and the malleolus. In this position, the lateral malleolus and the lower end of the fibula will usually reduce quite well. Good results are obtainable if this method is done early, before connective or scar tissue forms between the tibia and the fibula.

DISCUSSION

The advantages of the approach described for the treatment of the posterior fragment, as well as the anterior fragment of the tibia, can be best appreciated when the time comes for the removal of some of the hardware. Usually this is done between two and six months after the patient is permitted to resume weight-bearing.

Nearly all observers agree that anterior fragments should be fastened with a screw placed through the anterior fragment into the posterior main shaft of the tibia. The screw so placed can be removed quite easily by making a short incision, under local anesthesia, directly over the head of the screw. It was the ease of reduction of this anterior fragment that led to the procedure herein described for extending the usefulness of this method to the posterior fragment. It has been used for more than ten years with good results.

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